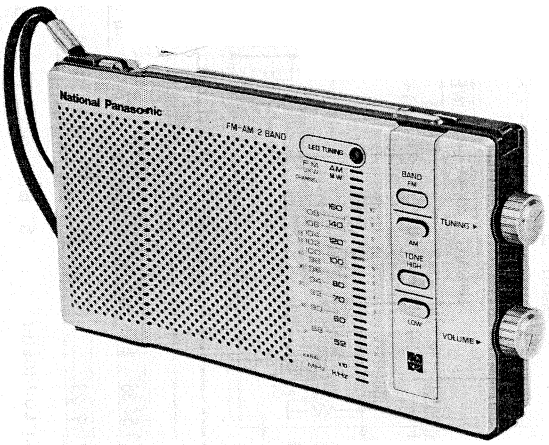
ORDER NO. RD7807-1599

Service Manual

Radio

RF-038

FM-AM
PORTABLE RADIO



■ SPECIFICATIONS

Frequency Range:	FM 87.5～108 MHz MW 520～1610 kHz (577～186m)
Intermediate Frequency:	FM 10.7 MHz AM 455 kHz
Sensitivity:	FM 3μV for 50mW Output MW 100μV/m for 50mW Output
Power Output:	500mW Maximum
Batteries:	6V (Four "AA" Size Penlight Batteries) (National UM-3 or equivalent)
Speaker:	6.5 cm ($2\frac{1}{2}$") PM Dynamic Speaker
Dimensions:	165 (Wide) × 96 (High) × 27 (Deep) mm ($6\frac{1}{2}$" × $3\frac{25}{32}$" × $1\frac{3}{32}$")
Weight:	302 g. ($10\frac{1}{2}$ oz.) without batteries
Impedance:	Speaker .....6Ω Earphone Jack 8Ω

Specifications are subject to change without notice for further improvement.

■ TO REMOVE PC BOARD

① Turn the tuning knob fully clockwise.
② Remove the two(2) knobs.
③ Remove the two(2) screws.

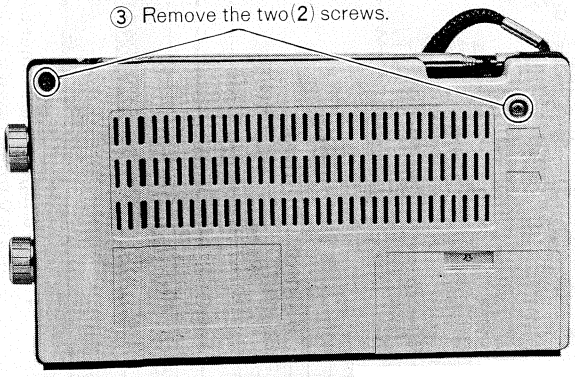
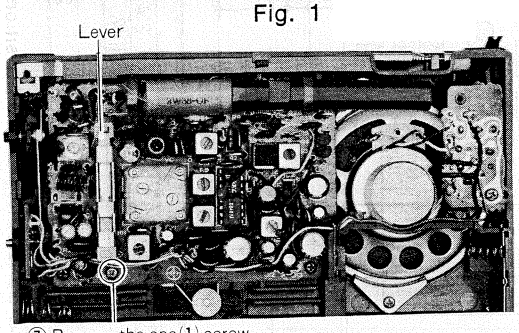


Fig. 1



⑦ Remove the one(1) screw.
⑧ To reassemble, reverse the above procedure and note the followings.
1. Turn dial drum and tuning capacitor shaft fully counter-clockwise.
2. Insert the lever into the hole of band switch.

Fig. 3

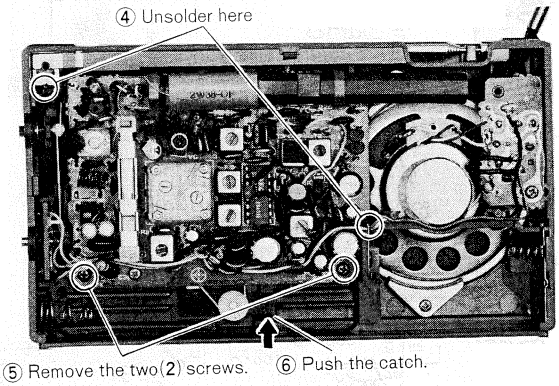
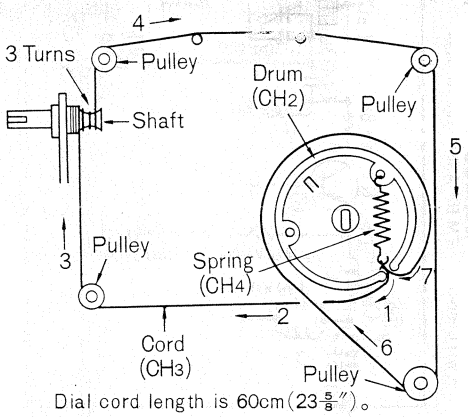


Fig. 2

■ DIAL CORD INSTALLATION



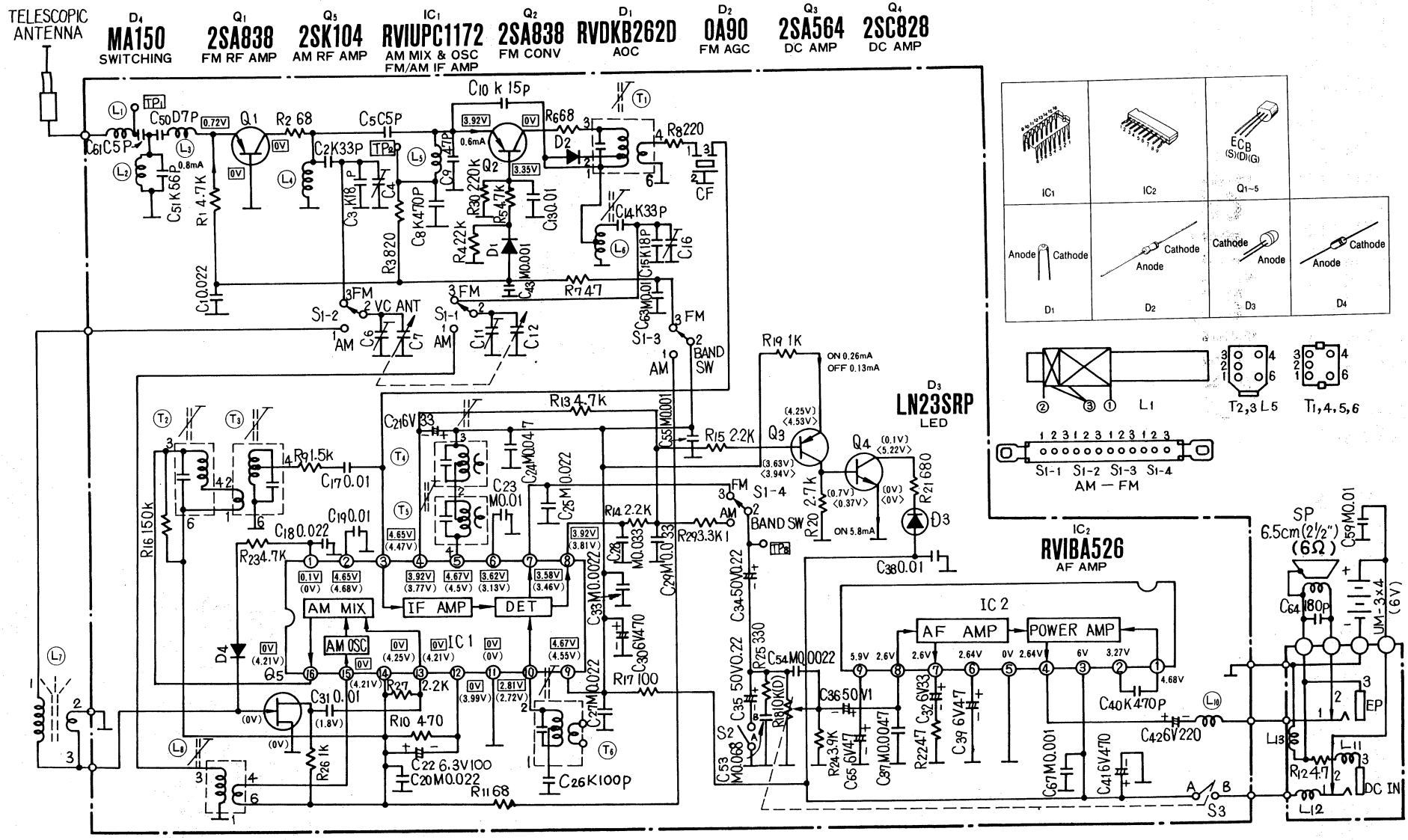
Dial cord length is 60cm($23\frac{5}{8}$").

Fig. 4

National Panasonic

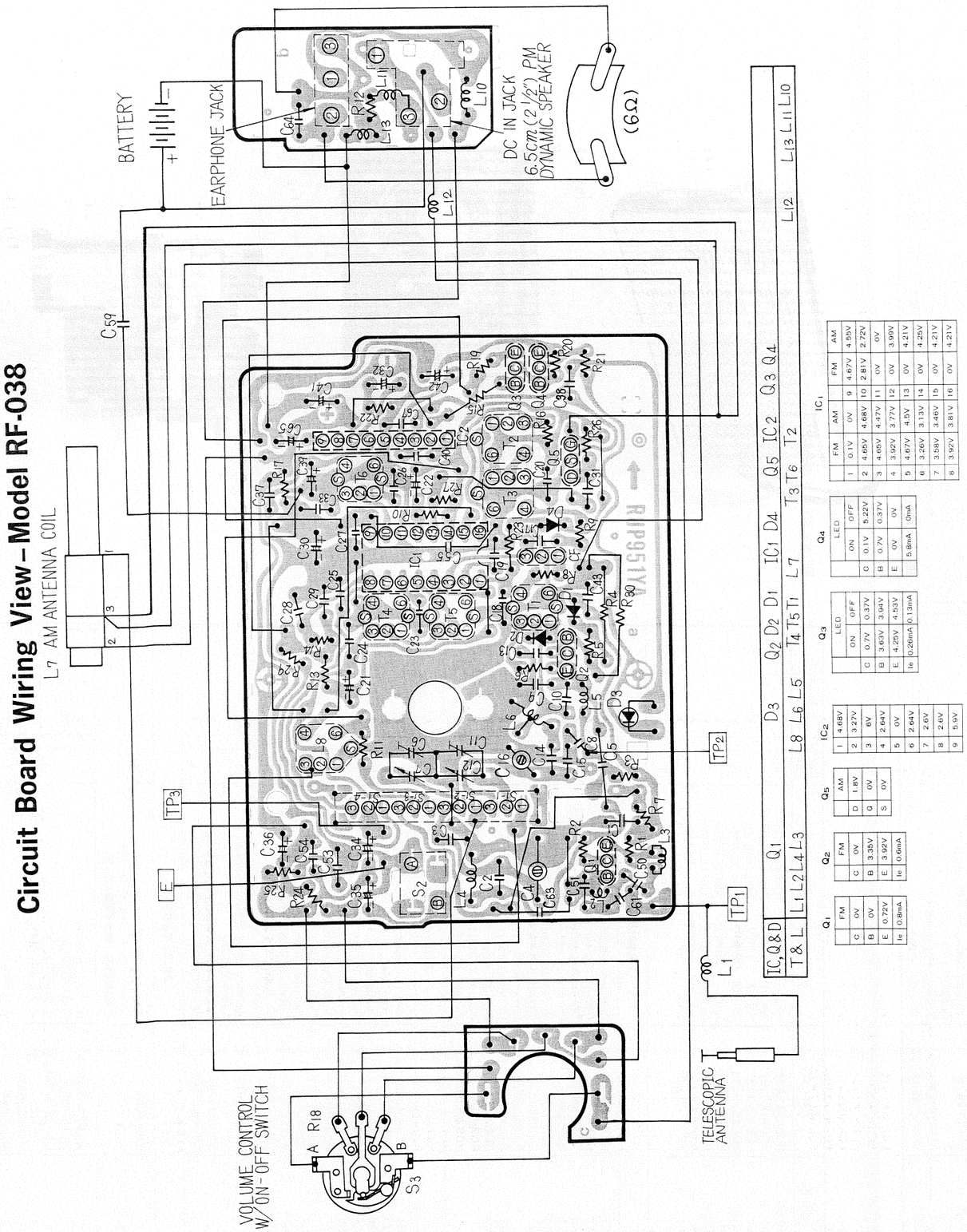
Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka, Japan

Schematic Diagram – Model RF-038



| | | |

Circuit Board Wiring View – Model RF-038



IC1

	FM	AM
1	0.1V	0V
2	4.65V	4.68V
3	4.66V	4.47V
4	3.92V	3.77V
5	4.67V	4.5V
6	3.26V	3.13V
7	3.58V	3.46V
8	3.92V	3.81V
9	4.67V	4.55V
10	2.81V	2.72V
11	0V	0V
12	0V	3.99V
13	0V	4.21V
14	0V	4.25V
15	0V	4.21V
16	0V	4.21V

Q4

LED	ON	OFF
C	0.1V	5.22V
B	0.7V	0.37V
E	0V	0V
	5.8mA	0mA

Q3

LED	ON	OFF
C	0.7V	0.37V
B	3.63V	3.94V
E	4.25V	4.53V
Ie	0.26mA	0.13mA

IC2

1	4.68V
2	3.27V
3	6V
4	2.64V
5	0V
6	2.64V
7	2.6V
8	2.6V
9	5.9V

Q5

	AM
D	1.6V
G	0V
S	0V

Q2

	FM
C	0V
B	3.35V
E	3.92V
Ie	0.6mA

Q1

	FM
C	0V
B	0V
E	0.72V
Ie	0.8mA

■ ALIGNMENT INSTRUCTIONS

Notes:
1. Set volume control to maximum.
2. Set band selector to AM or FM.
3. Set tone switch to HIGH.
4. Set power source voltage to 6 volts DC.
5. Output of signal generator should be no higher than necessary to obtain an output reading.

	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING (DISTANCE)	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
	CONNECTIONS	FREQUENCY				
	AM-IF ALIGNMENT					
(1)	Fashion loop of several turns of wire and radiate signal into loop of receiver.	470 kHz 30% Mod. with 400 Hz.	Point of non-interference. (on/about 600 kHz).	Output meter across voice coil.	T_2 (1st IFT) T_3 (2nd IFT) T_4 (3rd IFT)	Adjust for maximum output.
	AM-RF ALIGNMENT					
(2)	〃	550 kHz	550 kHz (Fig. 6)	〃	L_8(OSC Coil) (＊1)L_7(ANT Coil)	Adjust for maximum output. Adjust L_7 by moving coil bobbin along ferrite core.
(3)	〃	1500 kHz	1500 kHz (Fig. 7)	〃	C_{11} (OSC Trimmer) C_6 (ANT Trimmer)	Adjust for maximum output. Repeat steps (2) and (3).
	(＊1) Cement antenna bobbin with wax after completing alignment.					
	FM-IF ALIGNMENT					
(4)	High side thru. 0.001μF to point TP2, Negative side to earth.	10.7 MHz (400 kHz SWP.)	Point of non-Interference. (on/about 90 MHz).	Connect vert. amp. of scope to point TP3, Negative side to earth.	T_1 (FM 1st IFT) T_5 (FM 2nd IFT) (Primary)	Adjust for maximum amplitude. (Refer to fig. 9).
(5)	〃	〃	〃	〃	T_6 (FM 2nd IFT) (Secondary)	Adjust for maximum amplitude. (Refer to fig. 10).
	FM-RF ALIGNMENT					
(6)	Connect to point TP1 through FM dummy antenna. Negative side to earth. (Refer to fig. 11.)	87.2 MHz	Tuning capacitor fully closed.	Output meter across voice coil.	L_6 (OSC Coil)	(＊2) Adjust for maximum output.
(7)	〃	90 MHz	Tune to signal.	〃	L_4 (Tuning Coil)	〃
(8)	〃	106 MHz	106 MHz (Fig. 8)	〃	C_{16} (OSC Trimmer) C_4 (Tuning Trimmer)	(＊2) Adjust for maximum output. Repeat steps (6)～(8).
	(＊2) Three output responses will be present; proper tuning is the center frequency.					

■ ALIGNMENT POINT

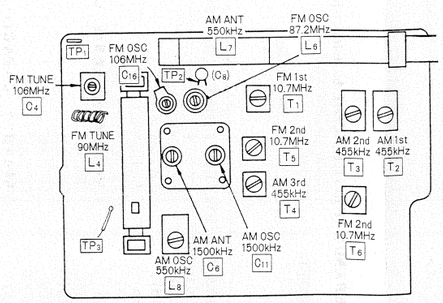


Fig. 5

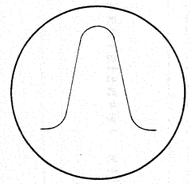


Fig. 9

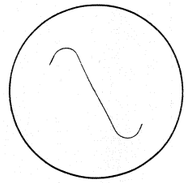


Fig. 10

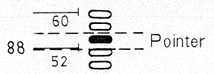


Fig. 6 (550 kHz)

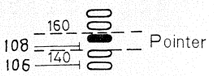


Fig. 7 (1500 kHz)

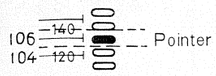


Fig. 8 (106 MHz)

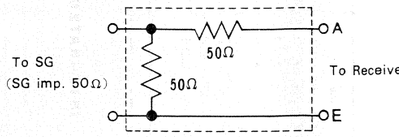


Fig. 11 FM Dummy Antenna

■REPLACEMENT PARTS LIST·····Model RF-038
(RD7807-1599)

NOTES: 1. Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.
2. X–Z rank : X rank parts will cover 80% of repair needs.
X+Y rank parts will cover 95% of repair needs.
Z rank parts are less necessary.
3. Components identified by shaded area have special characteristic important for safety.
When replacing any of these components use only manufacturer's specified parts.
4. Part numbers shown in bold letters are service standard parts and may differ from production parts.
5. The ○ mark is used by the manufacturing plant only.

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
INTEGRATED CIRCUITS, TRANSISTORS AND DIODES					
IC1	RVIUPC1172	IC, AM Mix & Oscillator, FM/AM IF Amp.	1		○X
IC2	RVIBA526	IC, AF Amp.	1		X
Q1,2	2SA838	Transistor (Ge), FM RF Amp., FM Converter	2		X
Q3	2SA564	Transistor (Ge), DC Amp.	1		X
Q4	2SC828	Transistor (Si), DC Amp.	1		X
Q5	2SK104	Transistor (Si), AM RF Amp.	1		X
D1	RVDKB262D	Diode (Si), Operation Compensator	1		X
D2	**OA90**	Diode (Ge), FM AGC	1		X
D3	**RVDGL30PR3**	Diode (Ga), LED	1		X
D4	**MA161**	Diode (Si), Switching	1		X
CERAMIC FILTER, COILS AND TRANSFORMERS					
CF	RVF107MFR	Ceramic Filter	1		X
L4	RLD4Y45	Tuning Coil, FM	1		X
L6	RLA4N8	Oscillator Coil, FM	1		X
L7	RLF2W38	Antenna Coil, AM	1		○X
L8	RLO2M3	Oscillator Coil, AM	1		X
T1,5	**RLI4B153**	IFT, FM	2		X
T2	**RLI2M201**	IFT, AM	1		X
T3	**RLI2M202**	IFT, AM	1		X
T4	**RLI2B157X**	IFT, AM	1		X
T6	**RLI4B351**	IFT, FM	1		X
VARIABLE RESISTOR					
R18	EVLOAB851D14	Variable Resistor, 100KΩ (D), Volume Control, W/ON-OFF Switch	1		○X
VARIABLE CAPACITORS					
C7,12	**PVCLY20TN**	Tuning Capacitor, W/Trimmer Capacitor (C6,11)	1		Y
C4	RCV1PX20AGS	Trimmer Capacitor	1		Y
C16	ECV1ZW20X53D	Trimmer Capacitor	1		Y

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
SPEAKER					
SP	EAS65P01SE	Speaker, Imp. 6Ω, 6.5cm(2½"), PM Dynamic	1		○X
SWITCH					
S1-1~S1-4	ESD5313	Switch, Band	1		○X
RESISTORS					
R7,22	**ERD25TJ470**	47Ω, ¼Watt, ±5%, Carbon	2		Z
R2,6,11	**ERD25TJ680**	68Ω, ¼Watt, ±5%, Carbon	3		Z
R17	**ERD25TJ101**	100Ω, ¼Watt, ±5%, Carbon	1		Z
R8	**ERD25TJ221**	220Ω, ¼Watt, ±5%, Carbon	1		Z
R25	**ERD25TJ331**	330Ω, ¼Watt, ±5%, Carbon	1		Z
R10	**ERD25TJ471**	470Ω, ¼Watt, ±5%, Carbon	1		Z
R21	**ERD25TJ681**	680Ω, ¼Watt, ±5%, Carbon	1		Z
R3	**ERD25TJ821**	820Ω, ¼Watt, ±5%, Carbon	1		Z
R19,26	**ERD25TJ102**	1KΩ, ¼Watt, ±5%, Carbon	2		Z
R9	**ERD25TJ152**	1.5KΩ, ¼Watt, ±5%, Carbon	1		Z
R4,14,27	**ERD25TJ222**	2.2KΩ, ¼Watt, ±5%, Carbon	3		Z
R20	**ERD25TJ272**	2.7KΩ, ¼Watt, ±5%, Carbon	1		Z
R1,5,13,23	**ERD25TJ472**	4.7KΩ, ¼Watt, ±5%, Carbon	4		Z
R29	**ERD25TJ332**	3.3KΩ, ¼Watt, ±5%, Carbon	1		Z
R24	**ERD25TJ392**	3.9KΩ, ¼Watt, ±5%, Carbon	1		Z
R15	**ERD25TJ223**	22KΩ, ¼Watt, ±5%, Carbon	1		Z
R16	**ERD25TJ154**	150KΩ, ¼Watt, ±5%, Carbon	1		Z
R30	**ERD25TJ224**	220KΩ, ¼Watt, ±5%, Carbon	1		Z
R12	**ERD25TJ4R7**	4.7Ω, ¼Watt, ±5%, Carbon	1		Z
CAPACITORS					
C3	ECCD1H100KC	10PF, 50WV, ±10%, Ceramic	1		Z
C5,61	ECCD1H050CC	5PF, 50WV, ±0.25PF, Ceramic	2		Z
C50	ECCD1H070DC	7PF, 50WV, ±0.5PF, Ceramic	1		Z
C10	ECCD1H150KC	15PF, 50WV, ±10%, Ceramic	1		Z
C15	ECCD1H180KC	18PF, 50WV, ±10%, Ceramic	1		Z
C2,14	ECCD1H330KC	33PF, 50WV, ±10%, Ceramic	2		Z
C9	ECCD1H470KC	47PF, 50WV, ±10%, Ceramic	1		Z
C51	ECCD1H560K	56PF, 50WV, ±10%, Ceramic	1		Z
C26	ECCD1H101K	100PF, 50WV, ±10%, Ceramic	1		Z
C8,40	ECKD1H471KB	470PF, 50WV, ±10%, Ceramic	2		Z
C13,17,19,31,38	ECKD1H103ZF	0.01μF, 50WV, $^{+80}_{-20}$%, Ceramic	5		Z
C1,18	ECKD1H223ZF	0.022μF, 50WV, $^{+80}_{-20}$%, Ceramic	2		Z
C43,55,67	ECKD1H102MD	0.001μF, 50WV, ±20%, Ceramic	3		Z
C37	ECKD1H472MD	0.0047μF, 50WV, ±20%, Ceramic	1		Z
C33,54	ECKD1H222MD	0.0022μF, 50WV, ±20%, Ceramic	2		Z
C24	ECQG05473MZ	0.047μF, 50WV, ±20%, Polyester	1		Z
C53	ECQG05683MZ	0.068μF, 50WV, ±20%, Polyester	1		Z
C23,59,63	ECFVD103MD	0.01μF, 25WV, ±20%, Semi-Conductor	3		Z
C20,25,27	ECFVD223MD	0.022μF, 25WV, ±20%, Semi-Conductor	3		Z
C28,29	ECFVD333MD	0.033μF, 25WV, ±20%, Semi-Conductor	2		Z
C21,32	**ECEA1CS330**	33μF, 16WV, Electrolytic	2		Y

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
C39,65	**ECEA1AS470**	47μF, 10WV, Electrolytic	2		Y
C22	**ECEA1AS101**	100μF, 10WV, Electrolytic	1		Y
C42	**ECEA1AS221**	220μF, 10WV, Electrolytic	1		Y
C30,41	**ECEA0JS471**	470μF, 6.3WV, Electrolytic	2		Y
C36	**ECEA2AS010**	1μF, 100WV, Electrolytic	1		Y
C34,35	**ECEA50ZR22**	0.22μF, 50WV, Electrolytic	2		Y
C64	ECCD1H181K	180PF, 50WV, ±10%, Ceramic	1		Z
CABINET					
CA1	RYMF038XG	Cabinet Assembly	1		○X
CA2	RYFF038XG	Cabinet Cover Assembly	1		○X
CA3	XEARK99FCY	Telescopic Antenna, 6 Steps, 510mm	1		○X
CA4	RJC326A	Terminal, Battery ⊕ Side	1		Y
CA5	RJC730Z	Terminal, Battery ⊕,⊖ Side	1		Y
CA6	RJC735Z	Terminal Spring, ⊖ Side	1		Y
	RKK143Z	Cover, Battery Compartment	1		○X
CA7	RKH53A	Strap, Cabinet	1		X
CA8	RBN455Z	Knob, Tuning and Volume	2		X
	RNW603Z	Washer, Volume Knob	1		Z
	XTN26+10BFC	Screw, Cabinet Cover M'tg	2		Z
CHASSIS					
CH1	RYEF038N	Dial Assembly	1		○X
CH2	RDD307Z	Drum, Dial	1		○Y
CH3	**RDZ03Z**	Cord, Dial	1Roll		Y
CH4	**RDS2050A**	Spring, Dial	1		Y
CH5	RDP761Z	Pointer, Dial	1		Y
	RJJ32E	Jack, Earphone	1		X
	RJJ97Y	Jack, DC IN	1		X
CH6	RJT630Z	Terminal, Tone Switch	2		○Z
CH7	RUB164Z	Lever, Band and Tone Switch	2		○Z
CH8	RMA5079Z	Bracket, Core Antenna	2		○Z
CH9	RHG897X	Rubber, Tone Switch Lever	1		Z
	XTN26+6C	Screw, Circuit Board and Dial Assembly M'tg	3		Z
	XTN26+8C	Screw, Jack Circuit Board M'tg	1		Z
	XTN26+8CR	Red Screw, Circuit Board M'tg	2		Z
ACCESSORY					
	XEH1A1-P	Magnetic Earphone	1		Y
PACKING MATERIALS					
	XZB20×20A04	Polyethylene Cover	1		Z
	RPN9269Z	Pad Complete	1		○Z
	(Not Available, Order RPN9269Z)	Pad, Left Side	(1)		
		Pad, Right Side	(1)		
	RPK614Z	Gift Box	1		○Y
	RQX6260Z	Instruction Book	1		○Y

■ PARTS LOCATION

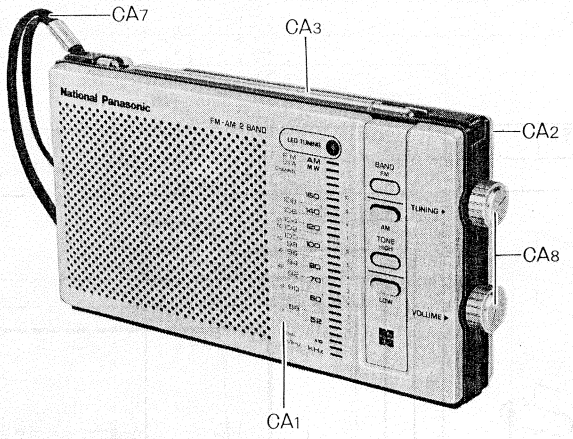


Fig. 12

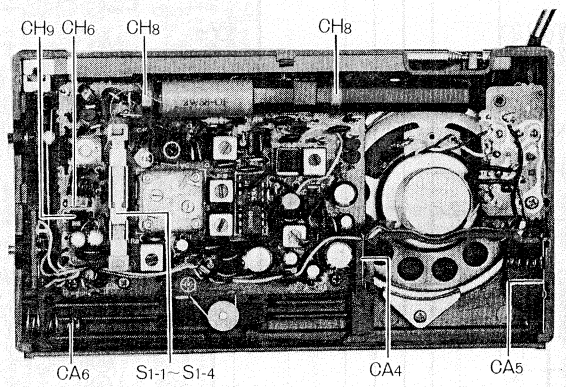


Fig. 13

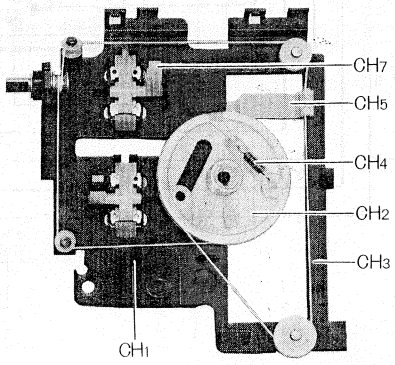


Fig. 14

RD Ⓕ XG/XAL
Printed in Japan